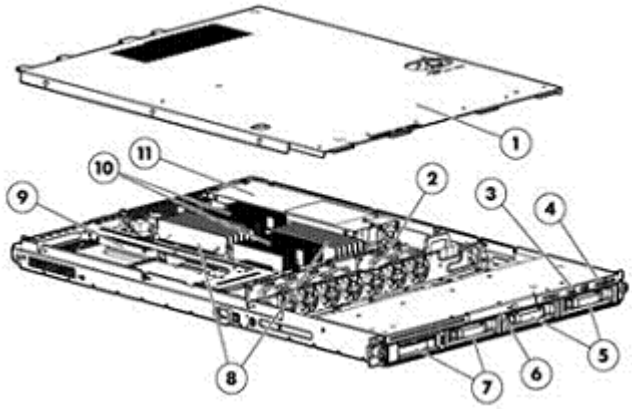
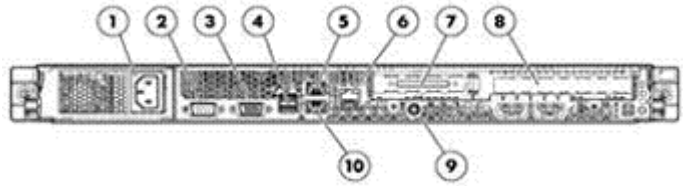
Overview

Hot Plug SAS/SATA and Non-Hot Plug SATA Models





Front View:

1. Access panel
2. System fans
3. Two USB ports
4. Power on/off & system LEDs
5. Optional 3rd and 4th 3.5" Non-Hot plug SATA or hot plug SAS/SATA hard drive bays
6. Optional DVD-RW or DVD-ROM drive
7. Standard 1st and 2nd 3.5" Non-Hot plug SATA or hot plug SAS/SATA hard drive bays (Small Form Factor drive cage not shown here. See the Storage Section for orientation of eight small form factor drive option)
8. Eighteen DIMM slots : DDR3 Registered (RDIMM) or Unbuffered (UDIMM) memory
9. Expansion Slots:
   Non-Hot Plug Models - One full-length/full height x16 PCI-Express Gen2 slot

   Hot Plug Models - One available half-length/full height x16 PCI-Express Gen2 slot and one internal only PCI-Express Gen2 slot (for internal storage controller - HP Smart Array P410 Controller ONLY)
10. Quad-Core Intel® Xeon® 5500 series processors (supports up to two)
11. Power supply (500 Watts - standard, other PS options available)

Rear View:

1. Power Supply Cable Socket
2. Video Port
3. Serial Port
4. Rear USB ports (2)
5. One GbE LAN ports for NIC 1 (RJ-45)
6. Optional LO100i 10/100 Mbps LAN port for IPMI management (RJ-45)
7. Low-Profile slot cover (not used in this model)
8. Full-height PCI-Express x16
9. UID - Rear Unit Identification LED
10. One GbE LAN ports for NIC 2 (RJ-45)

What's New

- Support for SAS and SATA Hot Plug Midline 2.5" Hard Drives

Overview

At A Glance

The HP ProLiant DL160 G6 server is a high performance, low cost, ultra-dense, dual processor capable, 1U rack server for memory intense High Performance Computing (HPC) environments, Web 2.0, hosting, and general large memory footprint server deployments.

- Processors:
  - Supports up to two Intel® Quad-Core 5500 sequence processors
    - Quad-Core Intel® Xeon® processors 5500 sequence with 8 MB Level 3 cache
  - Intel® 5520 Chipset
- Memory:
  - Up to 144GB, using PC3-10600 or PC3-8500R DDR3 Registered (RDIMM) memory, operating at 800MHz when fully populated at 3 DIMMs per Channel in 18 slots.
  - Up to 24GB, using PC3-10600E DDR3 Unbuffered (UDIMM) memory, operating at 1066MHz when fully populated at 2 DIMMs per Channel in 12 slots.
- Internal Drive Support:
  - Support for up to four 3.5" Non-Hot plug serial ATA (SATA) hard drives or;
  - Support for up to four 3.5" Hot plug Serial Attached SCSI (SAS) or SATA hard drives.
    NOTE: Installation of the Hot Plug Backplane 1U 2S Kit (512181-B21) is required if ordering third or fourth Hard Drives for Hot Plug models only.
  - Support for 2.5" Hot Plug Serial Attached SCSI (SAS) or SATA hard drives.
    NOTE: Installation of the HP 8SFF Hard Drive Cage & Backplane G6, FIO (515938-B21) is required if ordering 2.5" Hot Plug hard drives.
  - Internal storage capacity of up to 4.0TB (4 x 1TB Hot Plug 3.5" SATA/SAS), 3.0TB (4 x 750GB Non-Hot Plug SATA) or 4.0TB (8 x 500GB Hot Plug 2.5" SATA/SAS)
- Network Controller:
  - HP NC362i Integrated Dual Port Gigabit Server Adapter
- Storage Controllers:
  - Non-Hot Plug SATA Models: HP Embedded SATA RAID Controller (RAID 0, 1, 10)
    NOTE: Transfer rate: up to 3 Gb/s SATA
    NOTE: To enable RAID on Embedded SATA, use the HP Smart Array B110i SATA Raid controller, To enable use of the B110i, enter the ROM based setup utility (RBSU). The option for enabling RAID can be found in the Advanced section of the RBSU
  - Hot Plug SAS/SATA Models: HP P410 Smart Array Controller RAID 0,1,10, 5
    NOTE: Transfer rate: up to 3Gb/s
- Expansion Slots:
  - Non-Hot Plug Models: Up to two available PCI Express 2.0 slots:
    - Slot 1: full-length/full-height PCI-Express 2.0 x16 or
    - Slot 1: half-length/full-height PCI-Express 2.0 x16
    - Slot 2: low-profile internal only PCI-Express 2.0 x4 (x8 mechanically)
  - Hot Plug Models: One available PCI-Express slot:
    - Slot 1: half-length/full-height PCI-Express 2.0 x16
    - Slot 2: low-profile internal only PCI-Express 2.0 x4 (x8 mechanically) - slot populated by the SAS/SATA storage controller - Smart Array P410 Controller
- Infrastructure Management:
  - HP Insight Control suite for Linux (ICE-LX), a product option, delivers essential infrastructure management that can help save time and money by making it easy to deploy, monitor, control and optimize your IT infrastructure through a single, simple management console. The ICE-LX suite supports Linux-based servers and management consoles
  - HP ProLiant Onboard Administrator Powered Lights-Out 100i with optional LO100i Advanced Licenses for Virtual KVM and Virtual Media.
  - The HP ProLiant Easy Set-up CDs and ISO image downloads offer Assisted and Manual single server installation, setup, and deployment capability. Capabilities provided are:

  - AutoRun
  - Assisted Installation Microsoft Windows 2003 Server and Microsoft Windows 2008 Server
  - OS and SW available for Manual Installation are listed on each servers' QuickSpecs

- Ports:
  - Five USB ports (two front, one internal, two rear)
    NOTE: In order to utilize the internal USB port the USB cable (P/N: 536769-B21) must be connected to the internal USB header.
- Optical Drive:
  - Support for one (optional): DVD-ROM, DVD RW
- Power Supply:
  - 500W Power Supply (Non-Hot Plug, Autoswitching)
  - Optional FIO high-efficiency pluggable power supplies: 460W Power Supply or 750W Power Supply
- Additional Features:
  - Support for NVIDIA Quadro FX3700 512MB PCIe x 16 graphics card
    NOTE: For more information on the latest visualization and acceleration qualification status, please see http://www.hp.com/go/accelerators
- Form Factor:
  - Rack (1U)
- Operating Systems and Virtualization Software:
  - Supports Windows, RHEL, SLES, Solaris, VMware, and Citrix Essentials for XenServer (Retail)
- Deployment/Serviceability:
  - HP ProLiant DL160 G6 models have fixed rails which provide support for racks with round mounting holes and tool-free support for racks with square mounting holes (including Compaq/HP 7000, 9000, 10000 and HP series), with an adjustment range of 26" - 36"
  - Tool-less access to all system components for easy in rack serviceability
  - Customer Self Repair (CSR): HP products are designed with many CSR parts to minimize repair time and allow for greater flexibility in performing defective parts replacement
- Warranty:
  - This product is covered by a global limited warranty and supported by HP Services and a worldwide network of HP Authorized Channel Partners. Hardware diagnostic support and parts replacement is available for three years from date of purchase. Support for software and initial setup is available for 90 days from date of purchase. Enhancements to warranty services are available through HP Care Pack services or customized service agreements. SATA hard drives have a one year warranty. SAS Midline drives have a one-year warranty. SAS Enterprise drives have a three-year warranty.
    NOTE: Server Warranty includes 3 year Next Day Parts replacement, 0-Years Labor, 0-Years Onsite support. Additional information regarding worldwide limited warranty and technical support is available at: http://h18004.www1.hp.com/products/servers/platforms/warranty/index.html.

Standard Features

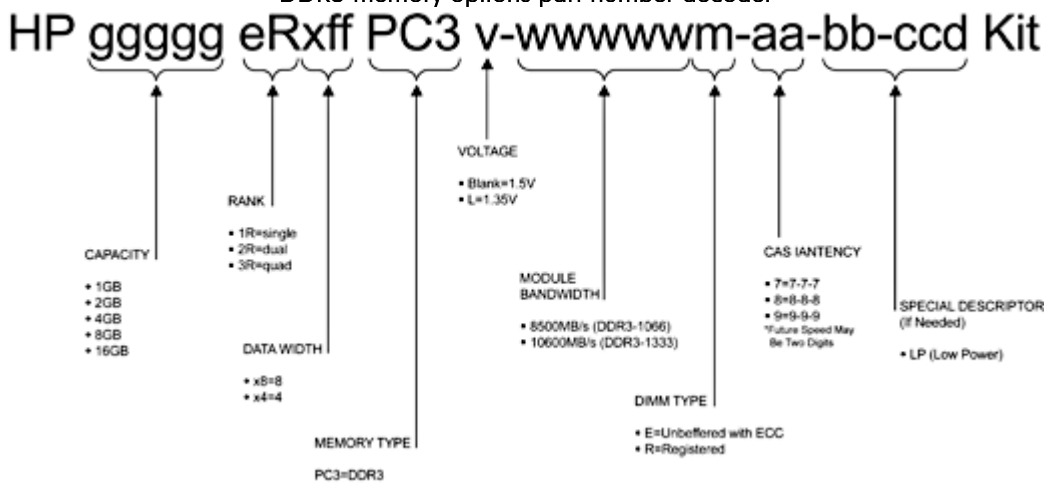
Processor One of the following depending on Model	Intel® Xeon® Processor X5570 (2.93 GHz, 8MB L3 Cache, 95W, DDR3-1333, HT, Turbo 2/2/3/3) NOTE: Available through Configure To Order only. See Factory Integration Models section for more details. Intel® Xeon® Processor X5560 (2.80 GHz, 8MB L3 Cache, 95W, DDR3-1333, HT, Turbo 2/2/3/3) NOTE: Available through Configure To Order only. See Factory Integration Models section for more details. Intel® Xeon® Processor X5550 (2.66 GHz, 8MB L3 Cache, 95W, DDR3-1333, HT, Turbo 2/2/3/3) Intel® Xeon® Processor E5540 (2.53 GHz, 8MB L3 Cache, 80W, DDR3-1066, HT, Turbo 1/1/2/2) NOTE: Available through Configure To Order only. See Factory Integration Models section for more details. Intel® Xeon® Processor E5530 (2.40 GHz, 8MB L3 Cache, 80W, DDR3-1066, HT, Turbo 1/1/2/2) NOTE: Available through Configure To Order only. See Factory Integration Models section for more details. Intel® Xeon® Processor E5520 (2.26 GHz, 8MB L3 Cache, 80W, DDR3-1066, HT, Turbo 1/1/2/2) Intel® Xeon® Processor L5520 (2.26 GHz, 8MB L3 Cache, 60W, DDR3-1066, HT, Turbo 1/1/2/2) Intel® Xeon® Processor E5504 (2.00 GHz, 4MB L3 Cache, 80W, DDR3-800) NOTE: HT indicates that the processor model supports Intel® Hyper-Threading Technology. NOTE: Turbo indicates the maximum potential frequency increment when using Intel® Turbo Boost Technology, with 4, 3, 2, and 1 cores active. NOTE: DDR3 speed is the maximum memory speed of the processor. Actual memory speed may depend on the quantity and type of DIMMs installed. NOTE: For the Intel 5500 Series, the letter preceding the model number indicates the performance/wattage of the processor. "X" denotes High Performance/Wattage; "E" denotes Enterprise Performance/Wattage (Mainstream); and "L" denotes Lower Wattage.
Upgradeability	Upgradeable to two processors
Chipset	Intel® 5520 Chipset
Cache Memory	4 MB Level 3 cache (E5504) 8 MB Level 3 cache (standard)
Memory Protection	Advanced memory protection

Standard Features

Memory	Type	DDR3 Registered (RDIMM) or Unbuffered (UDIMM)	
	Standard	4 GB	(2 x 2 GB) UDIMMs
		6 GB	(3 x 2 GB) UDIMMs
		12 GB	(6 x 2 GB) RDIMMs
	Maximum (RDIMM)	144 GB	(18 x 8 GB)
	Maximum (UDIMM)	24 GB	(12 x 2 GB)

NOTE: Depending on the memory configuration and processor model, the memory speed may run at 1333MHz, 1066MHz, or 800MHz. Please see the Online Memory Configuration Tool at: www.hp.com/go/ddr3memory-configurator.

DDR3 memory options part number decoder



Network Controller	HP NC362i Integrated Dual Port Gigabit Server Adapter

Expansion Slots #	Technology	Bus Width	Connector Width*	Bus Number*	Device No.**	Form Factor	Notes
1	PCI-Express 2.0	x16	x16	1	0	Full length, full height	3.3 volts
2***	PCI-Express 2.0	x4	x8	6	3	Low Profile, Internal Only	3.3 volts

NOTE: All slots can accept universal keyed PCI cards

* Default bus assignment. Inserting cards with PCI bridges may alter the actual bus assignment number.

** Slots are enumerated differently based on OS. MS OS's enumerate from lowest to highest Device ID by bus (starting with the lowest bus).

***In order to access expansion slot #2, the low profile internal only slot, expansion slot #1 may only be populated with a half length, full height form factor card.

Standard Features

Storage Controller	Non-Hot Plug SATA Models	HP Embedded SATA RAID Controller (integrated into the south-bridge) supporting SW RAID 0,1,10 NOTE: Transfer rate: up to 3 Gb/s SATA
		HP Smart Array B110i SATA RAID NOTE: To enable RAID for embedded SATA controller, use EZ set-up CD to download driver, hpahcisr.sys, is part of the 8.20 PSP, Smart Start, EZSetup CD. For more information on SW Smart Array, go to: http://www.HP.com/go/SWRAID
	Hot Plug SATA/SAS Models	HP Smart Array P410 Controller (RAID 0/1/1+0) HP Smart Array P410 Controller 256 BBWC (RAID/0/1/1+0/5/5+0) NOTE: Transfer rate: up to 3 Gb/s SATA, up to 3 Gb/s SAS.
	NOTE: A diskette drive or virtual FDD using LO100 Advanced Pack is needed to install storage controller drivers during a Windows operating system installation from a CD. NOTE: Addition of the battery backed cache upgrade enables BBWC, RAID 5, 5+0, array expansion, logical drive extension, RAID migration, and stripe size migration. NOTE: RAID 6 functionality requires the addition of Smart Array Advanced Pack (P/N: 516471-B21). NOTE: The addition of a Smart Array hardware based storage controller to a Non-Hot Plug SATA Model is only supported for external storage.	

Storage	Diskette Drives	Via USB only
	Optical Drives	Optional SATA 9.5mm DVD-ROM Optical Drive
		Optional SATA 9.5mm DVD RW Optical Drive
	Drive Bays	Up to 4 Non-hot plug SATA 3.5" drives
		Up to 4 Hot plug SAS/SATA 3.5" drives

Maximum Internal Storage	Non-Hot Plug SATA	3.0TB	4 x 750GB
	Hot Plug SATA	4.0TB	4 x 1TB
	Hot Plug SAS	4.0TB	4 x 1TB

Interfaces	Parallel	None
	Network RJ-45(Ethernet)	2 10/100/1000 NIC ports (plus 1 optional dedicated port for the HP ProLiant Lights Out 100i Remote Management)
	Serial	1
	Pointing Device (Mouse)	0 (via USB only)
	Graphics	1
	Keyboard	0 (via USB only)
	USB	5 (two front, one internal, two rear) NOTE: In order to connect a USB device internally, the internal USB Cable G6 Kit must be used (536769-B21) NOTE: Please see the following URL for additional information regarding USB support: http://h18004.www1.hp.com/products/servers/platforms/usb-support.html.

Standard Features

Graphics	32MB shared supporting 1600x1200x16M resolution	
Form Factor	Rack (1U), (1.75 in/4.45 cm)	
Embedded Systems Management	HP ProLiant Onboard Administrator and LO100i Advanced	HP ProLiant Onboard Administrator (powered by LO100i Lights-Out 100) with Optional LO100i Advanced Licenses for Virtual KVM and Virtual Media. Features: • Embedded IPMI standard reporting • System event log access • Remote Serial console (serial redirection) • Browser, Telnet access • SMASH-CLP compliant • IPMI 2.0 compliant • Secure Socket Layer Encryption • Secure Shell Encryption • Virtual media (Floppy, CD, USB 2.0) with Advanced License • Virtual KVM with Advanced License
Core Infrastructure Management	HP Insight Control (ICE) suites	HP Insight Control suite for Linux (ICE-LX), as a product option, delivers essential infrastructure management that can help save time and money by making it easy to deploy, monitor, remote control, and optimize your IT infrastructure through a single, simple management console. The ICE-LX suite installs and license software modules that are integrated into HP System Insight Manager. The HP Insight Control suite for Linux (ICE-LX) serves environments requiring a Linux-based management consoles. See www.hp.com/go/ice-linux HP Insight Control suites include one year of 24 x 7 HP Software Technical Support and Update Service ensuring rapid access to HP support staff and proactive delivery of software updates. For more information about this service, please visit: http://www.hp.com/services/insight.
Industry Standard Compliance	ACPI V2.0 Compliant PCI 2.2 Compliant PXE Support WOL Support Microsoft® Logo certifications IPMI 2.0, SMASH CLP compliant	

Standard Features

Security	Power-on password Setup password Diskette boot control Secure Sockets Layer (SSL) Secure Shell (SSH)
Security - Trusted Platform Module	The TPM (Trusted Platform Module) is a microcontroller chip that can securely store artifacts used to authenticate the server platform. These artifacts can include passwords, certificates and encryption keys. Windows® BitLocker™ Drive Encryption (BitLocker) is a data protection feature available in Windows Server® 2008. BitLocker leverages the enhanced security capabilities of a Trusted Platform Module (TPM) version 1.2. The TPM works with BitLocker to help protect user data and to ensure that a server running Windows Server 2008 has not been tampered with while the system was offline. NOTE: For more information about TPM, including a white paper, go to: http://www.hp.com/go/TPM NOTE: ProLiant OS pre-installed units will come with the partition required for TPM deployment. NOTE: The TPM key is unique to every TPM deployed server and must be retained. Misplacing or losing the key could result in data loss.
Server Power Cords	One 6' Highline (IEC-IEC) power cord ships standard NOTE: HP ProLiant DL servers no longer ship standard with NEMA power cords (163719-002) that allow connection to 110V US wall outlets in a home or office. ProLiant DL servers are primarily connected to PDU's in data center racks so they now ship standard with only a PDU power cord (416151-B21). If a user wishes to power a ProLiant DL server using a 110V receptacle (NEMA-15), the NEMA power cord (227099-001) must be ordered separately. If customers require a local power cord, they can check the power cord matrix for the appropriate cord. Please see the following power cord matrix: http://www.hp.com/go/powercordmatrix.
UPS and PDU Power Cord Matrix	Please see the UPS and PDU cable matrix's on the HP Power Protection and Management page. Under Power Cords, click on the "HP Power Cord Matrix" link. That link will list cable descriptions, requirements, and specifications for UPS and PDU units. Please see the following link: www.hp.com/products/powercords.
Power Supply	500 Watts, auto-switching, high efficiency, PFC (Power Factor Correcting) NOTE: Factory upgradeable to high-efficiency (HE) pluggable power supply.
System Fans	6 system fans ship standard; Non-hot plug, Non-redundant

Standard Features

Operating Systems and Virtualization Software Support for ProLiant Servers	Microsoft Windows Server Microsoft Windows Server Hyper V Red Hat Enterprise Linux (RHEL) SUSE Linux Enterprise Server (SLES) Solaris 10 for x86/x64 based Systems Citrix Essentials for XenServer (Retail) NOTE: For more information on HP's Certified and Supported ProLiant Servers for OS and Virtualization Software and latest listing of software drivers available for your server, please visit our Support Matrix at: http://www.hp.com/go/supportos and our driver download page http://www.hp.com/support/DL160G6.
Rack Airflow Requirements	Rack 10000 G2 series Cabinets The increasing power of new high-performance processor technology requires increased cooling efficiency for rack-mounted servers. The 10000 G2 Series Racks provide enhanced airflow for maximum cooling, allowing these racks to be fully loaded with servers using the latest processors. CAUTION: If a third-party rack is used, observe the following additional requirements to ensure adequate airflow and to prevent damage to the equipment: Front and rear doors: If your 42U server rack includes closing front and rear doors, you must allow 5,350 sq cm (830 square inches) of hole evenly distributed from top to bottom to permit adequate airflow (equivalent to the required 64 percent open area for ventilation). Side: The clearance between the installed rack component and the side panels of the rack must be a minimum of 7 cm (2.75 inches) CAUTION: Always use blanking panels to fill all remaining empty front panel U-spaces in the rack. This arrangement ensures proper airflow. Using a rack without blanking panels results in improper cooling that can lead to thermal damage. NOTE: For additional information, refer to the Setup and Installation Guide or the Documentation CD provided with the server, or to the server documentation located in the Support section at the following URL: www.hp.com/servers/dl160.
Rack Support	The DL Fixed Rail System supports installation in racks with square or round mounting holes (including Compaq/HP 7000, 9000, 10000 and HP series), with an adjustment range of 24" - 36".
Telco Rack Support	Support for all 2 and threaded hole racks requires an additional option kit from Rack Solutions. The Rack Solutions brackets can be purchased at: http://www.racksolutions.com/hp. NOTE: The 4 post Telco racks also supported.

Standard Features

Factory Express Portfolio for Servers and Storage

HP Factory Express offers configuration, customization, integration and deployment services for HP servers and storage products. Customers can choose how their factory solutions are built, tested, integrated, shipped and deployed.

Factory Express offers service packages for simple configuration, racking, installation, complex configuration and design services as well as individual factory services, such as image loading, asset tagging, and custom packaging. HP products supported through Factory Express include a wide array of servers and storage: HP Integrity, HP ProLiant, HP ProLiant Server Blades, HP BladeSystem, HP 9000 servers as well as the MSAxxxx, VA7xxx, EVA, XP, rackable tape libraries and configurable network switches.

For more information on Factory Express services for your specific server model please contact your sales representative or go to: http://www.hp.com/go/factory-express.

HP Enterprise Configurator

The HP eConfigure Enterprise Configurator now provides factory default racking for our HP hardware portfolio. This approach is aligned with our strategic direction to meet the needs and expectations of our valued customers. If you require "custom" rack configuration, please contact HP's Customer Business Center or an Authorized Partner for assistance.

Service and Support

HP Care Pack Services provide total care and support expertise with committed response designed to meet your IT and business needs.

HP Care Pack Services provide total care and support expertise with committed response designed to meet your IT and business needs.

HP Care Pack services include coverage for the HP branded hardware options qualified for the server that are purchased at the same time or afterward and internal to the enclosure. It also includes the 22" and smaller external monitors and tower UPS options up to 3kVA. These items will be covered at the same service level and for the same coverage period as the server. Coverage of UPS Battery is not included and standard warranty terms & conditions apply. For servers or storage systems installed within a rack, service also covers all HP qualified rack options installed within the same rack.

To fully capitalize on your HP ProLiant servers' capabilities requires a service partner who thoroughly understands your server technology and systems environment. HP Services, an industry leader in provision of multi vender support solutions provides a range of support services designed to meet the varying needs of business. Whether an SMB or large global corporation HP has a ProLiant server support offer to help you speedily deploy and maximize system uptime.

Recommended Service - Simplify ProLiant solution implementation, maintenance and management.

- Support Service - 3 Year, 9x5 Next Business Day coverage, excluding HP holidays only
- Deployment Service - Hardware Installation only

Enhanced Service - Optimize service level to increase IT performance and availability

- Support Service - 3 Year 13x5 Same Business Day, 4-Hour response coverage
- Deployment Service - Hardware Installation only

Installation of a ProLiant server and Microsoft or Linux O/S per the Customer Description and/or Data Sheet. To be delivered on a scheduled basis 8am-5pm, M-F, excl. HP holidays.

For a complete listing of service offerings and information visit:
http://www.hp.com/services/proliantservices
http://www.hp.com/go/proliant/carepack

HPC Interconnects

NOTE: High Performance Computing (HPC) interconnect technologies are available for the DL160 G6 under the Cluster Platform product portfolio. These high-speed interconnects are fully supported by HP when they are part of these configure to order clusters. Solutions can be defined with a lot of flexibility with the help of configuration tools. Please visit the following URL to configure HPC Clusters with InfiniBand, Gigabit Ethernet or Myrinet Interconnects: http://www.hp.com/techservers/clusters/ucp/index.html

HPC Interconnects	InfiniBand	PCI-Express Generation 2 adapters
	Gigabit Ethernet	Use embedded ports
	10-Gigabit Ethernet	PCI-Express Generation 2

Models

Non-Hot Plug Serial ATA (SATA) Models

NOTE: Non-Hot Plug models are not upgradeable to Hot Plug. The addition of a Smart Array controller is supported for external storage use only.

HP DL160G6 E5504 NHP SATA, 4GB 490427-xx1	Processor(s)	Intel® Xeon® Processor E5504 (2.00 GHz, 4MB L3 Cache, 80W, DDR3-800)
	One of the following depending on model	Intel® Xeon® Processor L5520 (2.26 GHz, 8MB L3 Cache, 60W, DDR3-1066, HT, Turbo 1/1/2/2)
HP DL160G6 L5520 NHP SATA, 4GB 490432-xx1	Cache Memory	4MB shared L3 cache (E5504)
		8MB shared L3 cache (L5520)
	Memory	4GB (2 x 2GB) PC3-10600E (UDIMM)
	Network Controller	HP NC362i Integrated Dual Port Gigabit Server Adapter
	Storage Controller	Embedded SATA RAID 0, 1, 10
	Hard Drive	HP 160GB 7.2k Non Hot Plug SATA
	Internal Storage	Up to 4 large form factor Non-Hot Plug drives
	Optical Drive	None ships standard
	Power Supply	500W high efficiency multi-output supply (ships standard)
	Form Factor	1U

Hot Plug Serial ATA (SATA)/ Serial Attached SCSI (SAS) Models

NOTE: Up to 4 large form factor hard drives supported in server model (P/N 490455-B21).
NOTE: Up to 2 large form factor hard drives supported in server models (P/N 490454-B21 and 490442-B21).

HP DL160G6 E5504 Hot Plug,4GB 490442-xx1	Processor(s)	Intel® Xeon® Processor E5504 (2.00 GHz, 4MB L3 Cache, 80W, DDR3-800)
	One of the following depending on model	Intel® Xeon® Processor E5520 (2.26 GHz, 8MB L3 Cache, 80W, DDR3-1066, HT, Turbo 1/1/2/2)
HP DL160G6 E5520 Hot Plug, 6GB 490454-xx1		(2) Intel® Xeon® Processor X5550 (2.66 GHz, 8MB L3 Cache, 95W, DDR3-1333, HT, Turbo 2/2/3/3)
	Cache Memory	4MB shared L3 cache (E5504)
HP DL160G6 X5550 Hot Plug, 4LFF, 12GB, 2P 490455-xx1	One of the following depending on model	8MB shared L3 cache
	Memory	4GB (2 x 2GB) PC3-10600E (UDIMM)
	One of the following depending on model	6GB (3 x 2GB) PC3-10600E (UDIMM)
		12GB (6 x 2GB) PC3-10600R (RDIMM)
	Network Controller	HP NC362i Integrated Dual Port Gigabit Server Adapter
	Storage Controller	HP Smart Array P410 SAS/SATA RAID 0,1,10 HP Smart Array P410/ 256MB BBWC RAID 0,1,10,5,50 (P/N 490455-xx1)
	Hard Drive	None ship standard
	Internal Storage	Up to 4 large form factor Hot Plug drives
	One of the following depending on model	Up to 2 large form factor Hot Plug drives
	Optical Drive	None ship standard
	Power Supply	500W high efficiency multi-output supply (ships standard)
	Form Factor	1U

Country Code Key	xx = 00	U.S.
	xx = 20	Brazil (ONLY P/N 490442-xx1)
	xx = 29	Japan
	xx = 37	APD
	xx = 42	Euro
	xx = AA	PRC

NOTE: This section lists some of the steps required to configure a Factory Integrated Model. To ensure only valid configurations are ordered, HP recommends the use of an HP approved configurator. Contact your local sales representative for additional information.
NOTE: HP does not allow factory integration of options into standard models listed above. Configure-to-order servers must start with a CTO Chassis.
NOTE: FIO indicates that this option is a Factory Installable Option.

Step 1: Base Configuration (choose one of the following configurable models)

Non-Hot Plug SATA Model

NOTE: Non-Hot Plug models are not upgradeable to Hot Plug. The addition of a Smart Array controller is supported for external storage use only.

HP ProLiant DL160 G6 Non-Hot Plug SATA Rack CTO Chassis	491531-B21

Factory Integrated Model ships with:

HP NC362i Integrated Dual Port Gigabit Server Adapter
One available full-length/full-height PCI-Express x16 Generation 2 slot
One Highline IEC Power Cord
6 Non-Hot Plug Fans
Rack (1U), (1.75 in / 4.45 cm)
Tool-less Fixed Rails

Hot Plug Model

HP ProLiant DL160 G6 Hot Plug SAS/SATA Rack CTO Chassis	491532-B21

Factory Integrated Model ships with:

HP NC362i Integrated Dual Port Gigabit Server Adapter
One available PCI-Express Generation 2 slot:

Slot 1: half-length/full-height
Slot 2: low-profile/half-height - occupied by P410 Smart Array controller
One Highline IEC Power Cord
6 Non-Hot Plug Fans
Rack (1U), (1.75 in / 4.45 cm)
Tool-less Fixed Rails

Step 2: Choose Required Options (only one of the following from each list unless otherwise noted)

Processors	Quad-Core Processors	
	Intel® Xeon® Processor X5570 (2.93 GHz, 8MB L3 Cache, 95W, DDR3-1333, HT, Turbo 2/2/3/3), FIO NOTE: If 2 processors are desired, select one 508231-L21 and one 508231-B21.	508231-L21
	Intel® Xeon® Processor X5560 (2.80 GHz, 8MB L3 Cache, 95W, DDR3-1333, HT, Turbo 2/2/3/3), FIO NOTE: If 2 processors are desired, select one 573893-L21 and one 573893-B21.	573893-L21
	Intel® Xeon® Processor X5550 (2.66 GHz, 8MB L3 Cache, 95W, DDR3-1333, HT, Turbo 2/2/3/3), FIO NOTE: If 2 processors are desired, select one 491511-L21 and one 491511-B21.	491511-L21
	Intel® Xeon® Processor E5540 (2.53 GHz, 8MB L3 Cache, 80W, DDR3-1066, HT, Turbo 1/1/2/2), FIO NOTE: If 2 processors are desired, select one 490461-L21 and one 490461-B21.	490461-L21
	Intel® Xeon® Processor E5530 (2.40 GHz, 8MB L3 Cache, 80W, DDR3-1066, HT, Turbo 1/1/2/2), FIO NOTE: If 2 processors are desired, select one 573895-L21 and one 573895-B21.	573895-L21
	Intel® Xeon® Processor E5520 (2.26 GHz, 8MB L3 Cache, 80W, DDR3-1066, HT, Turbo 1/1/2/2), FIO NOTE: If 2 processors are desired, select one 490459-L21 and one 490459-B21.	490459-L21
	Intel® Xeon® Processor L5520 (2.26 GHz, 8MB L3 Cache, 60W, DDR3-1066, HT, Turbo 1/1/2/2), FIO NOTE: If 2 processors are desired, select one 491507-L21 and one 491507-B21.	491507-L21
	Intel® Xeon® Processor E5504 (2.00 GHz, 4MB L3 Cache, 80W, DDR3-800), FIO NOTE: If 2 processors are desired, select one 490457-L21 and one 490457-B21.	490457-L21
	NOTE: HT indicates that the processor model supports Intel® Hyper-Threading Technology. NOTE: Turbo indicates the maximum potential frequency increment when using Intel® Turbo Boost Technology, with 4, 3, 2, and 1 cores active. NOTE: DDR3 speed is the maximum memory speed of the processor. Actual memory speed may depend on the quantity and type of DIMMs installed. NOTE: For the Intel 5500 Series, the letter preceding the model number indicates the performance/wattage of the processor. "X" denotes High Performance/Wattage; "E" denotes Enterprise Performance/Wattage (Mainstream); and "L" denotes Lower Wattage.	

Memory	Registered DIMMs (RDIMMs)	
	HP 2GB 2Rx8 PC3-10600R-9 Kit	500656-B21
	HP 4GB 2Rx4 PC3-10600R-9 Kit	500658-B21
	HP 4GB 4Rx8 PC3-8500R-7 LP Kit	500660-B21
	HP 8GB 2Rx4 PC3-10600R-9 Kit	500662-B21
	HP 8GB 2Rx4 PC3-8500R-7 Kit	516423-B21
	Unbuffered with ECC DIMMs (UDIMMs)	
	HP 1GB 1Rx8 PC3-10600E-9 Kit	500668-B21
	HP 2GB 2Rx8 PC3-10600E-9 Kit	500670-B21
	NOTE: All DDR3 memory option kits consist of one DIMM per kit. For detailed memory configuration rules and guidelines, please use the Online DDR3 Memory Configuration Tool: www.hp.com/go/ddr3memory-configurator. NOTE: Kits described as LP include Low Power DIMMs. For more information on ProLiant Energy Efficient Features, see: http://www.hp.com/go/proliant-energy-efficient	
	NOTE: There is a maximum support limitation of 8 ranks per memory channel (maximum of 2 quad rank DIMMs per channel)	
Hard Drive	NOTE: The components of a storage subsystem (e.g. the drive, the HBA/controller, and the server backplane) should operate at the same data transfer rate or the system bandwidth will be negotiated down to an acceptable level for all components.	
	SATA Non-Hot Plug 3.5" Midline (MDL) Drive	
	NOTE: A minimum of one SATA Non-Hot Plug hard drive is required ONLY when purchasing Non-Hot Plug CTO Chassis Model (P/N 491531-B21) in Step 1.	
	HP 750GB 3G SATA 7.2K NHP 3.5" MDL HDD	462595-B21
	HP 500GB 3G SATA 7.2K NHP 3.5" MDL HDD	458941-B21
	HP 250GB 3G SATA 7.2K NHP 3.5" MDL HDD	458939-B21
	SATA Non-Hot Plug 3.5" Entry (ETY) Drives	
	HP 160GB 3G SATA 7.2K NHP 3.5" ETY HDD	458947-B21

Configuration Information - Factory Integrated Models

Storage Controllers	NOTE: A minimum of one Smart Array Controller is ONLY required when purchasing Hot Plug CTO Chassis Model (P/N 491532-B21) in Step 1. NOTE: The below storage controllers are intended for use with internal drives in the Hot Plug CTO Chassis Model (P/N 491532-B21). The HP Smart Array P212 Controller (P/N 491191-B21) is supported in the Non-Hot Plug Model (P/N 491531-B21) for external storage control ONLY. NOTE: With the HP Smart Array P410 Controller, the addition of the battery backed cache upgrade enables BBWC, RAID 5, 5+0, array expansion, logical drive extension, RAID migration, and stripe size migration.In order to upgrade to RAID 6, at least 256MB Cache and a Battery is required in addition to the Smart Array Advanced Pack license (P/N 516471-B21). NOTE: To use the internal only PCI-e slot when purchasing the Hot Plug CTO Chassis, a HP Smart Array P410 controller must be selected. When selecting the HP Smart Array P212 Controller (P/N 491191-B21), the controller will be installed in the x16 slot since it has both an internal and external port. This prevents the use of the internal slot and no PCI-E slots will be available.	
	HP Smart Array P212/256 MB w/ Battery FIO	491191-B21
	HP P410/Zero Memory FIO Smart Array Controller	462860-B21
	HP Smart Array P410/256 MB w/Battery FIO	491195-B21
Hot Plug HDD Backplane Option	NOTE: A minimum of one Hot Plug HDD Backplane option is ONLY required when purchasing Hot Plug CTO Chassis Model (P/N 491532-B21) in Step 1.	
	HP 8SFF Hard Drive Cage & Backplane G6, FIO	515938-B21
	HP 2 HDD Backplane G6 FIO Kit NOTE: Supports LFF hard drives only.	518593-B21
	HP 4HDD Hot Plug Backplane G6 Kit NOTE: Supports LFF hard drives only.	512181-B21
Power Supplies	CAUTION: Many HP ProLiant Servers now offer new power options, including Common Slot Power Supplies. These power supplies come in multiple power ratings and higher efficiency levels to offer the Right Size solution to fit your configuration. This provides improved power delivery and the advantage of reclaiming lost power. Prior to making a power supply selection it is "highly recommended" that the "HP Power Advisor" is run to determine the right size power supply for your server configuration. The HP Power Advisor is located at: www.hp.com/go/hppoweradvisor. In ProLiant Servers that have more than one power slot (bay), only same size power supplies are recommended. If non-matched power supplies are inserted you will get errors and operation will fail.	
	HP High Efficiency 500W Multi-output Power Supply Kit	515915-B21
	HP High Efficiency 460W Power Supply Kit	535684-B21
	HP High Efficiency 750W Power Supply Kit	535683-B21

Step 3: Choose Additional Options for Factory Integration

NOTE: For additional "Core Options" and "Additional Options", please refer to the "Options" section below.

Core Options

NOTE: Some options may not be available for factory integration. Please contact an HP sales representative for additional information.

Unique Options	HP Dedicated Management Port Kit	516006-B21
Processor	Quad-Core Processors	
	Intel® Xeon® Processor X5570 (2.93 GHz, 8MB L3 Cache, 95W, DDR3-1333, HT, Turbo 2/2/3/3)	508231-B21
	Intel® Xeon® Processor X5560 (2.80 GHz, 8MB L3 Cache, 95W, DDR3-1333, HT, Turbo 2/2/3/3)	573893-B21
	Intel® Xeon® Processor X5550 (2.66 GHz, 8MB L3 Cache, 95W, DDR3-1333, HT, Turbo 2/2/3/3)	491511-B21
	Intel® Xeon® Processor E5540 (2.53 GHz, 8MB L3 Cache, 80W, DDR3-1066, HT, Turbo 1/1/2/2)	490461-B21
	Intel® Xeon® Processor E5530 (2.40 GHz, 8MB L3 Cache, 80W, DDR3-1066, HT, Turbo 1/1/2/2)	573895-B21
	Intel® Xeon® Processor E5520 (2.26 GHz, 8MB L3 Cache, 80W, DDR3-1066, HT, Turbo 1/1/2/2)	490459-B21
	Intel® Xeon® Processor E5504 (2.00 GHz, 4MB L3 Cache, 80W, DDR3-800)	490457-B21
	Intel® Xeon® Processor L5520 (2.26 GHz, 8MB L3 Cache, 60W, DDR3-1066, HT, Turbo 1/1/2/2)	491507-B21
	NOTE: HT indicates that the processor model supports Intel® Hyper-Threading Technology. NOTE: Turbo indicates the maximum potential frequency increment when using Intel® Turbo Boost Technology, with 4, 3, 2, and 1 cores active. NOTE: DDR3 speed is the maximum memory speed of the processor. Actual memory speed may depend on the quantity and type of DIMMs installed. NOTE: For the Intel 5500 Series, the letter preceding the model number indicates the performance/wattage of the processor. "X" denotes High Performance/Wattage; "E" denotes Enterprise Performance/Wattage (Mainstream); and "L" denotes Lower Wattage.	

Core Options

Memory	**Registered DIMMs (RDIMMs)**	
	HP 2GB 2Rx8 PC3-10600R-9 Kit	500656-B21
	HP 4GB 2Rx4 PC3-10600R-9 Kit	500658-B21
	HP 4GB 4Rx8 PC3-8500R-7 LP Kit	500660-B21
	HP 8GB 2Rx4 PC3-10600R-9 Kit	500662-B21
	HP 8GB 2Rx4 PC3-8500R-7 Kit	516423-B21
	Unbuffered with ECC DIMMs (UDIMMs)	
	HP 1GB 1Rx8 PC3-10600E-9 Kit	500668-B21
	HP 2GB 2Rx8 PC3-10600E-9 Kit	500670-B21
	NOTE: All DDR3 memory option kits consist of one DIMM per kit. For detailed memory configuration rules and guidelines, please use the Online DDR3 Memory Configuration Tool: www.hp.com/go/ddr3memory-configurator. NOTE: Kits described as LP include Low Power DIMMs. For more information on ProLiant Energy Efficient Features, see: http://www.hp.com/go/proliant-energy-efficient	
Optical Drives	DVD-ROM Drive Optical Drive	481045-B21
	DVD RW Drive Optical Drive	481047-B21
Hard Drives	NOTE: The components of a storage subsystem (e.g. the drive, the HBA/controller, and the server backplane) should operate at the same data transfer rate or the system bandwidth will be negotiated down to an acceptable level for all components.	
	SATA Hot Plug SFF Midline (MDL) Drives	
	HP 500GB 3G SATA 7.2K 2.5in MDL HDD	507750-B21
	HP 160GB 3G SATA 7.2K 2.5in MDL HDD	530888-B21
	SATA Hot Plug SFF Entry (ETY) Drives	
	HP 250GB 3G SATA 5.4K SFF ETY HDD	460355-B21
	HP 120GB 1.5G SATA 5.4K SFF ETY HDD	458924-B21
	SATA Non-Hot Plug 3.5" Midline (MDL) Drives (Non-Hot Plug Models Only)	
	HP 750GB 3G SATA 7.2K NHP 3.5" MDL HDD	462595-B21
	HP 500GB 3G SATA 7.2K NHP 3.5" MDL HDD	458941-B21
	HP 250GB 3G SATA 7.2K NHP 3.5" MDL HDD	458939-B21
	SATA Non-Hot Plug 3.5" Entry (ETY) Drives	
	HP 160GB 3G SATA 7.2K NHP 3.5" ETY HDD	458947-B21
	SATA Hot Plug 3.5" Midline (MDL) Drives (SAS/SATA Hot Plug Models Only) NOTE: A SAS HBA or Array Controller is required.	
	HP 1TB 3G SATA 7.2K 3.5" MDL HDD	454146-B21
	HP 750GB 3G SATA 7.2K 3.5" MDL HDD	458930-B21
	HP 500GB 3G SATA 7.2K 3.5" MDL HDD	458928-B21
	HP 250GB 3G SATA 7.2K 3.5" MDL HDD	458926-B21
	SATA Hot Plug 3.5" Entry (ETY) Drives	
	HP 160GB 3G SATA 7.2K 3.5" ETY HDD	458945-B21

NOTE: SATA hard drives have a 1-year warranty. Please see QuickSpecs for Technical Specifications and additional information: http://h18000.www1.hp.com/products/quickspecs/13021_div/13021_div.html (Worldwide)

SAS Hot Plug SFF Midline (MDL) Drives	
HP 500GB 6G SAS 7.2K SFF DP MDL HDD	507610-B21
SAS Hot Plug 3.5" Midline (MDL) Drives	
HP 1TB 3G SAS 7.2K 3.5" DP MDL HDD	461137-B21
HP 750GB 3G SAS 7.2K 3.5" DP MDL HDD	461135-B21
SAS Hot Plug SFF Enterprise (ENT) Drives	
HP 300GB 6G SAS 10K SFF DP ENT HDD	507127-B21
HP 300GB 3G SAS 10K SFF DP ENT HDD	492620-B21
HP 146GB 6G SAS 10K SFF DP ENT HDD	507125-B21
HP 146GB 3G SAS 10K SFF DP ENT HDD	418367-B21
HP 146GB 6G SAS 15K SFF DP ENT HDD	512547-B21
HP 146GB 3G SAS 15K SFF DP ENT HDD	504062-B21
HP 72GB 6G SAS 15K SFF DP ENT HDD	512545-B21
HP 72GB 3G SAS 15K SFF DP ENT HDD	418371-B21
HP 72GB 3G SAS 10K SFF DP ENT HDD	384842-B21
SAS Hot Plug 3.5" Enterprise (ENT) Drives	
HP 450GB 3G SAS 15K 3.5" DP ENT HDD	454232-B21
HP 400GB 3G SAS 10K 3.5" DP ENT HDD	459508-B21
HP 300GB 3G SAS 15K 3.5" DP ENT HDD	416127-B21
HP 146GB 3G SAS 15K 3.5" DP ENT HDD	384854-B21

NOTE: The purchase of SAS HBA or array controller is required.

NOTE: SAS Enterprise drives have a 3-year warranty Please see the QuickSpecs for Technical Specifications and additional information: http://h18000.www1.hp.com/products/quickspecs/12244_div/12244_div.html (Worldwide)

Core Options

Communications	Gigabit Ethernet Adapters	
	HP NC112T PCIe Gigabit Server Adapter	503746-B21
	HP NC360T PCI Express Dual Port Gigabit Server Adapter	412648-B21
	HP NC373F PCI Express Multifunction Gigabit Server Adapter	394793-B21
	HP NC373T PCI Express Multifunction Gigabit Server Adapter	394791-B21
	HP NC382T PCI Express Dual Port Multifunction Gigabit Server Adapter	458492-B21
	HP NC364T PCI Express Quad Port Gigabit Server Adapter	435508-B21
	10 Gigabit Ethernet Adapters	
	HP NC522SFP Dual Port 10GbE Server Adapter	468332-B21
	NOTE: A minimum of two Gigabtyes (2GB) of server memory is required for each NC522SFP adapter. NOTE: Direct Attach Cable (DAC) for copper environments or fiber transceivers and cables for fiber-optic environments must be purchased separately. NOTE: Please see the QuickSpecs for Technical Specifications and additional information: www.hp.com/go/ProLiantNICs	

Additional Options

Remote Management	HP LO100i Advanced Pack, No Media 1-Server License including 1 year of 24x7 Technical Support and Updates NOTE: For additional License Kits please see the Lights-Out 100i QuickSpecs at: www.hp.com/go/lo100	530521-B21
HP Insight Control Suite (ICE)	NOTE: Electronic licensing options are available for Insight Control suites software products. Please see the appropriate Insight Control QuickSpecs for additional information. www.hp.com/go/ice. HP Insight Control suite for Linux	
	HP Insight Control suite for Linux, Media pack (DVD) - No licenses included NOTE: This optional Media pack DVD contains the ISO image for HP Insight Control Environment for Linux, HP System Insight Manager, HP Insight Power Manager, HP Insight Virtual Machine Manager for ProLiant, and an integrated installer. Servers must be acquired separately. NOTE: This Media pack is optional because the latest ISO image and latest updates may be downloaded at no cost from: http://www.hp.com/go/ice-linux (click on Download button).	464422-B22
	HP Insight Control suite for Linux, No Media, 1-Server license, including one year of 24x7 Technical Support and Updates NOTE: This part number can be used to purchase one (1) license with a single activation key. Customer will receive a printed license entitlement certificate via physical shipment. The license entitlement certificate must be redeemed online or via fax in order to obtain the license activation key(s). Includes one year of 24 x 7 HP Software Technical Support and Update Service. NOTE: One certificate is shipped for each license. NOTE: For additional License Kits, please see the QuickSpecs at: http://h18000.www1.hp.com/products/quickspecs/13019_div/13019_div.html	464423-B22
Graphic Cards	HP NVIDIA FX3700 512 MB PCI-E 16x Kit NOTE: Additional graphics and accelerator cards can be used via third party offering. If using the High Efficiency 500W Multi-output Power Supply Kit (P/N: 515915-B21) the following Graphics Card Power Adapter Kit (P/N: 533955-B21) should be used to supply additional power to the card.	490062-B21
Hot Plug HDD Backplane Option	HP 4HDD Hot Plug Backplane G6 Kit NOTE: Installation of the 4 HDD Hot Plug Backplane G6 Kit (512181-B21) is required if ordering third or fourth Hard Drives for Hot Plug models only.	512181-B21
Security	HP Trusted Platform Module Option Kit	488069-B21

Additional Options

Storage Controllers	NOTE: The addition of storage controllers for internal hard drive use is intended for use ONLY with the Hot Plug SATA/SAS Model Chassis (P/N 491532-B21). The addition of a storage controller to the Non-Hot Plug Model Chassis (P/N 491531-B21) is supported for external storage ONLY. NOTE: To utilize the internal only slot, the HP Smart Array P410 Controller must be selected. The selection of the HP Smart Array P212 Controller for internal and external connectivity, will require the use of the Full Length Full Height PCI-E x16 slot NOTE: With the HP Smart Array P410 Controller, the addition of the battery backed cache upgrade enables BBWC, RAID 5, 5+0, array expansion, logical drive extension, RAID migration, and stripe size migration.In order to upgrade to RAID 6, at least 256MB Cache and a Battery is required in addition to the HP Smart Array Advanced Pack license (P/N 516471-B21).	
	SAS Controllers	
	Smart Array P212 Controller	
	HP Smart Array P212/Zero Memory Controller	462828-B21
	HP Smart Array P212/256MB Controller	462834-B21
	Smart Array P410 Controller	
	HP Smart Array P410/256MB Controller	462862-B21
	HP Smart Array P410/512MB with BBWC	462864-B21
	Storage Controllers for use with External Storage Only	
	HP Smart Array P411/256MB Controller	462830-B21
	HP Smart Array P411/512MB BBWC	462832-B21
	NOTE: Please see the following QuickSpecs for Technical Specifications and additional information: http://h18000.www1.hp.com/products/quickspecs/13203_div/13203_div.html (Smart Array P212 Controller) http://h18000.www1.hp.com/products/quickspecs/13201_div/13201_div.html (Smart Array P410 Controller) http://h18000.www1.hp.com/products/quickspecs/13202_div/13202_div.html (Smart Array P411 Controller)	
HPC Specific Options	HP IB 4X DDR Conn-X PCI-e G2 Dual Port HCA	483514-B21
	HP IB 4X DDR PCI-e DUAL PORT HCA	448397-B21
	HP IB 4X QDR Conn-X PCI-e G2 Dual Port HCA	517721-B21
	NOTE: For HPC interconnect adapters please see the HPC Interconnect section of this QuickSpecs.	

Additional Options

Tape Storage	NOTE: For the complete listing of Tape Drive offerings, please see: http://www.hp.com/products1/storage/compatibility/tapebackup/ISS/index.html	
	Tape Drives	
	USB Rack-Mount Tape Drives	
	HP StorageWorks 1U USB Rack-Mount Kit with one DAT 160 USB Tape Drive NOTE: Pre-configured with one DAT 160 USB tape drive.	AG703A
	SAS Rack-Mount Tape Drives NOTE: HP recommends purchasing the HP Smart Array P212 (P/N 464828-B21) for a dedicated SAS HBA for tape.	
	HP StorageWorks 1U SAS Rack-Mount Kit with one LTO-4 Ultrium 1760 NOTE: Pre-configured with one LTO-4 Ultrium 1760 SAS tape drive.	EH946A
	HP StorageWorks 1U SAS Rack-Mount Kit NOTE: Supports up to (2) half-height SAS tape drives.	AE459A
	HP StorageWorks LTO-2 Ultrium 448 SAS Internal Tape Drive NOTE: Mounts inside the 1U SAS Rack-Mount Kit (AE459A).	DW085A
	HP StorageWorks LTO-3 Ultrium 920 SAS Internal Tape Drive NOTE: Mounts inside the 1U SAS Rack-Mount Kit (AE459A).	EH847A
	For an up-to-date listing of the latest O/S and software support details for HP Ultrium tape drives, please visit: http://www.hp.com/go/connect	
	Tape Autoloaders	
	HP StorageWorks 1/8 G2 Tape Autoloader	
	HP StorageWorks 1/8 G2 LTO-4 Ultrium 1760 SAS Tape Autoloader	AK377A
	HP StorageWorks 1/8 G2 LTO-3 Ultrium 920 SAS Autoloader	AH558A
	HP StorageWorks 1/8 G2 Tape Autoloader Rack Kit NOTE: Required to install the 1/8 G2 Autoloaders in a standard 19-inch rack; includes rails and rackmount instructions.	AH166A
	NOTE: Please see the QuickSpecs for Technical Specifications and additional information: http://www.hp.com/go/automation needed to create a complete solution; reference current compatibility information at: http://www.hp.com/go/ebs.	
	Tape Libraries	
	HP StorageWorks MSL2024 Tape Library	
	HP StorageWorks MSL2024 1 LTO-4 Ultrium 1760 SAS Drive Library	AK378A
	HP StorageWorks MSL2024 1 LTO-3 Ultrium 920 SAS Drive Library	AH559A
	HP StorageWorks MSL4048 Tape Library	
	HP StorageWorks MSL4048 2 LTO-4 Ultrium 1760 SAS Drive Library	AK380A
	HP StorageWorks MSL4048 1 Ultrium 920 SAS Drive Library	AH560A
	NOTE: Please see the QuickSpecs for Technical Specifications and additional information: http://www.hp.com/go/automation needed to create a complete solution; reference current compatibility information at: http://www.hp.com/go/ebs.	

Additional Options

Disk-Based Backup	RDX Removable Disk Backup	
	HP StorageWorks RDX320 External Removable Disk Backup System NOTE: 320GB of Disk Storage. NOTE: Please see the QuickSpecs for Technical Specifications and additional information: http://h18000.www1.hp.com/products/quickspecs/13036_div/13036_div.html	AJ768A
	D2D Backup	
	HP StorageWorks D2D120 Backup System with Data Protector Express Software Kit NOTE: 2TB of Disk Storage.	EH924A
	HP StorageWorks D2D130 Backup System with LTO-3 Ultrium 920 SAS Tape Drive NOTE: 3TB of Disk Storage.	EH952A
	HP StorageWorks D2D2502i Backup System NOTE: 2 TB raw capacity/1.5 TB useable capacity	EJ001A
	HP StorageWorks D2D4004i Backup System	EH938A
	HP StorageWorks D2D2504i Backup System	EJ002A
	NOTE: Please see the QuickSpecs for Technical Specifications and additional information: http://h18000.www1.hp.com/products/quickspecs/12651_div/12651_div.html (Worldwide)	
StorageWorks Options	StorageWorks Fibre Channel HBA	
	NOTE: The following is a list of all Fibre Channel Host Bus Adapters for Windows and Linux. For detailed compatibility information please see: http://h18006.www1.hp.com/storage/saninfrastructure/hba.html	
	HP StorageWorks FC2142SR 4Gb PCI-e FC HBA	A8002A
	HP StorageWorks FC1142SR 4Gb PCI-e FC HBA	AE311A
	HP StorageWorks FC2242SR 4Gb DC PCI-e FC HBA	A8003A
	HP StorageWorks FC1242SR 4Gb DC PCI-e FC HBA	AE312A
	HP StorageWorks 81E 8Gb Single Port PCI-e FC HBA	AJ762A
	HP StorageWorks 82E 8Gb Dual Port PCI-e FC HBA	AJ763A
	HP StorageWorks 81Q 8Gb Single Port PCI-e FC HBA	AK344A
	HP StorageWorks 82Q 8Gb Dual Port PCI-e FC HBA	AJ764A
	StorageWorks SCSI HBA	
	HP U320e SCSI Host Bus Adapter NOTE: Recommended Dual Channel Ultra320 SCSI Controller for connecting multi-drive MSL tape libraries to ProLiant servers.	AH627A

Additional Options

HP StorageWorks Modular Smart Array

HP StorageWorks 60 Modular Smart Array

HP StorageWorks 60 Modular Smart Array 418408-B21

NOTE: Rack-mountable 12-drive (3.5" 3G SAS/1.5G SATA) 2U enclosure with 3Gb/s SAS host connectivity and redundant power supplies.
NOTE: Please see the QuickSpecs for Technical Specifications and additional information:
http://h18000.www1.hp.com/products/quickspecs/12627_div/12627_div.html (Worldwide)

HP StorageWorks 70 Modular Smart Array

HP StorageWorks 70 Modular Smart Array 418800-B21

NOTE: Rack-mountable 25-drive (2.5" 3G SAS/1.5G SATA) 2U enclosure with 3Gb/s SAS host connectivity and redundant power supplies.
NOTE: Please see the QuickSpecs for Technical Specifications and additional information:
http://h18000.www1.hp.com/products/quickspecs/12652_div/12652_div.html (Worldwide)

Uninterruptible Power Systems

HP Rack-mountable UPS

HP UPS R1500 G2 UPS

HP, R1.5k VA UPS, 1U, NA AF419A

HP, R1.5kVA UPS, 1U, INTL AF418A

HP, R1.5kVA UPS, 1U, JPN/TW AF421A

NOTE: Please see the QuickSpecs for Technical Specifications and additional information:
http://h18000.www1.hp.com/products/quickspecs/13130_div/13130_div.html (Worldwide)

NOTE: Please see the QuickSpecs for Technical Specifications and additional information:
http://h18000.www1.hp.com/products/quickspecs/13129_div/13129_div.html (Worldwide)

NOTE: For additional information on HP Uninterruptable Power Systems please go to: www.hp.com/servers/rackups.

HP R3000 UPS

HP R3000 VA UPS, 2U, DTC, INTL AF414A

HP R3000 VA UPS, 2U, Low Voltage L5-30, NA AF422A

HP R3000 VA UPS, 2U, High Voltage L6-20, NA AF423A

HP R3000 VA UPS, 2U, High Voltage L6-20, JPN AF424A

HP R3000 VA UPS, 2U, Low Voltage L5-30, JPN AF425A

NOTE: Please see the QuickSpecs for Technical Specifications and additional information:
http://h18000.www1.hp.com/products/quickspecs/10671_div/10671_div.html (Worldwide)

HP R3000v Uninterruptible Power System

HP R3000v UPS AF444A

NOTE: The R3000v is available in China and India only.

NOTE: Please see the QuickSpecs for Technical Specifications and additional information:
http://h18000.www1.hp.com/products/quickspecs/13129_div/13129_div.html (Worldwide)

HP Rack-Mountable R5500 UPS

HP R5500 VA UPS, INTL	AF416A
HP R5500 VA UPS, NA/JPN	AF426A

NOTE: Please see the QuickSpecs for Technical Specifications and additional information:
http://h18000.www1.hp.com/products/quickspecs/11871_div/11871_div.html (Worldwide)
NOTE: For additional information on HP Uninterruptable Power Systems please go to: www.hp.com/servers/rackups.

Power Distribution Units

Monitored PDUs

HP Monitored Power Distribution Unit: Full Rack Version

HP 17.3 kVA S2324 Monitored PDU- dual input, 3Ø, 24A (NA/JPN)	AF503A
HP 8.6 kVA S1324 Monitored PDU- single input, 3Ø, 24A (NA/JPN)	AF504A
HP 16.6 kVA S2140 Monitored PDU- dual input, 1Ø, 40A (NA/JPN)	AF505A
HP 8.3 S1140 Monitored PDU- single input, 1Ø, 40A (NA/JPN)	AF506A
HP 22.1 kVA S2316 Monitored PDU- dual input, 3Ø, 16A (INTL)	AF507A
HP 11 kVA S1316 Monitored PDU- single input, 3Ø, 16A (INTL)	AF508A
HP 14.7 kVA S2132 Monitored PDU- dual input, 1Ø, 32A (INTL)	AF509A
HP 7.3 kVA S1132 Monitored PDU- single input, 1Ø, 32A (INTL)	AF510A

HP Monitored Power Distribution Unit: Half Rack Version

HP 4.9 kVA S124 Monitored PDU- single input, 1Ø, 24A (NA/JPN)	AF914A
HP 7.3 kVA S132 Monitored PDU- single input, 1Ø, 32A (INTL)	AF915A

NOTE: Please see the QuickSpecs for Technical Specifications and additional information:
http://h18000.www1.hp.com/products/quickspecs/12118_div/12118_div.html (Worldwide)

Modular PDUs 1U/0U (Up to 28 outlets)
NOTE: 1U/0U mounting brackets shipped with the unit (optimized for 10000 G2 and 9000 series racks).

Fixed Cord Extension Bars	351655-B21

NOTE: Two extension bar sticks; each with (7) C13 plugs.

3.6kVA Model - mPDU, 16A, High (WW)	252663-B24
2.8 kVA Model - mPDU, 24A, Low (NA/JPN)	252663-D71
4.9kVA Model - mPDU, 24A, High (NA/JPN)	252663-D72
7.3kVA Model - mPDU, 32A, High (INT'L)	252663-B31
8.3kVA Model - mPDU, 40A, High (WW)	252663-B21
8.3kVA Model - mPDU, 40A, High (power cord attached) (NA/JPN)	252663-D73
9.2kVA Model - mPDU, 40A, High (power cord attached) (INTL)	252663-B32

NOTE: For additional information on HP Power Distribution Units including accessories please go to: www.hp.com/go/pdu (Worldwide)

HP Rack Series	**HP Rack 10000 G2 Series** (Carbon/Graphite Metallic)	
	10642 G2 (42U) Rack Cabinet 1200mm Deep - Shock Pallet	AF034A
	10642 G2 (42U) Rack Cabinet 1200mm Deep - Pallet	AF038A
	10647 G2 (47U) Rack Cabinet 1200mm Deep - Shock Pallet	AF044A
	10647 G2 (47U) Rack Cabinet 1200mm Deep - Pallet	AF045A
	NOTE: It is mandatory to use a shock pallet when shipping racks with equipment installed.	
	NOTE: xxxxxx-B22 (shock pallet) used to ship racks with equipment installed (by custom systems, VARs and Channels).	
	NOTE: Please see the QuickSpecs for additional information: http://h18000.www1.hp.com/products/quickspecs/12402_div/12402_div.html (Worldwide)	
	NOTE: For additional information regarding Rack Cabinets, please see the following URL: http://www.hp.com/go/rackandpower.	
HP Rack Options	**HP KVM Switch Options**	
	2x1x16 IP Console Switch with Virtual Media	AF601A
	4x1x16 IP Console Switch with Virtual Media	AF602A
	2x16 Server Console Switch with Virtual Media	AF600A
	HP Server Console Switch (KVM), 0 x 2 x 8 port	AF616A
	HP Server Console Switch (KVM), 0 x 2 x 16 port	AF617A
	HP 1x4 Console Switch	AF611A
	HP USB Server Console Cable, 6 foot, 2-Pack	AF613A
	NOTE: required for supporting USB peripherals.	
	NOTE: Cat5e cables are required to connect Interface Adapters to Console Switches. Cat5e cables can be found at the following URL: http://www.hp.com/go/kvm.	
	HP Serial Console Server Options	
	HP 16 Port Serial Console Server (worldwide)	AF101A
	HP 48 Port Serial Console Server (worldwide)	AF102A
	Serial Adapter, RJ45-D89 DCE Female, 1-pack	AF103A
	Serial Adapter, RJ45-D89 DCE Female, 8-pack	AF110A
	NOTE: For additional information regarding KVM switches, Serial Console servers, rack mount monitors, keyboards and all related options please see the following URL: http://www.hp.com/go/kvm.	

Additional Options

USB Options	USB 1.44-MB External Diskette Drive	DC141B
	USB Floppy Drive	DC361B
	HP USB-P/S2 Mouse	DC369A
	HP Keyboard (USB) standard 2004	DT528A#xxx
Service and Support Offerings (HP Care Pack Services)	**Hardware Services 4-Hour On-site Service**	
	4-Hour On-site Service, 5-Day x 13	U9509E
	Hour On-site Service, 7-Day x 24-Hour Coverage, 3 Years, Electronic	U9510E
	6-Hour Call to Repair On-Site Service, 3 Years, Electronic	U9511E
	Hardware Services	
	Next Business Day Onsite, HW Support, 3 year	U9508E
	Hardware Installation, Electronic	U9520E
	NOTE: For more information, customer/resellers can contact: http://www.hp.com/services/carepack	

HP ProLiant DL160 G6 (all models)

NOTE: Memory configurations listed do not apply to "Factory Integrated Models".

Standard Memory

4GB (2x2GB) or 6GB (3 x 2GB) depending on model, PC3-10600E Unbuffered UDIMM memory, with ECC.

Maximum Memory

Up to 144GB memory is available with the optional installation of PC3-10600R or PC3-8500R 8GB Registered RDIMM memory kits.

NOTE: Charts do not represent all possible memory configurations.

DDR3 memory population guidelines

NOTE: For detailed memory configuration rules and guidelines, please use the Online DDR3 Memory Configuration Tool: www.hp.com/go/ddr3memory-configurator

Some DIMM installation guidelines are summarized below:

- For servers with eighteen (18) memory slots:
  - There are three (3) channels per processor; six (6) channels per server
  - There are three (3) DIMM slots for each memory channel; eighteen (18) total slots
  - Memory channel 1 consists of the three (3) DIMMs that are closest to the processor
  - Memory channel 3 consists of the three (3) DIMMs that are furthest from the processor
- DIMM slots that are white should be populated first
- Do not mix Unbuffered memory (UDIMMs) with Registered memory (RDIMMs)
- Do not install DIMMs if the corresponding processor is not installed
- If only one processor is installed in a 2CPU system, only half of the DIMM slots are available
- To maximize performance, balance the total memory capacity between all installed processors
- It is not required, but it is recommended to load the channels similarly if possible
- You can only have up to eight (8) ranks installed per channel
- You can only install two quad-rank DIMMs per channel
- You can only install two UDIMMs per channel; if available, the third slot in the channel must remain empty
- Populate DIMMs from heaviest load (quad-rank) to lightest load (single-rank) within a channel
- Heaviest load (DIMM with most ranks) within a channel goes furthest from the chipset
- No mixing DIMM voltage; all DIMMs must be the same voltage

DIMM Type ->	Registered DIMMs (RDIMMs)					Unbuffered with ECC DIMMs (UDIMMs)	
DIMM Rank ->	Dual Rank (2R)				Quad Rank (4R)	Single Rank (1R)	Dual Rank (2R)
DIMM Capacity ->	2GB	4GB	8GB	8GB	4GB	1GB	2GB
DIMM Native Speed (MHz) ->	1333	1333	1066	1333	1066	1333	1333
SLOTS THAT CAN BE POPULATED							
18 slot servers	18	18	18	18	12	12	12
MAXIMUM CAPACITY (GB)							
18 slot servers	36	72	144	144	48	12	24
POPULATED DIMM SPEED (MHz)							
1 DIMM Per Channel	1333	1333	1066	1333	1066	1333	1333

Memory

2 DIMM Per Channel	1066	1066	1066	1333*	800	1066	1066
3 DIMM Per Channel	800	800	800	800	not supported	not supported	not supported
* - supported with ROM update via ROM Based Setup Utility (RBSU).							

NOTES:

- Mixing DIMM speeds is allowed, but the system processor speed rules always override the DIMM capabilities
- If you do mix DIMM speeds, the memory bus will default to the minimum clock rate of all DIMMs in the system - even if the slower DIMM is on the other processor
- If you install 1x 1066MHz DIMM in channel 1 and 1x 1333MHz DIMM in channel 2, you still run at 1066MHz
- If you install 1x 1066MHz DIMM in channel 1 and 5x 1333MHz DIMMs with 1 DIMM Per Channel (DPC) in each of the other channels, you run at 1066MHz
- If you install 3DPC in one channel (if applicable) and 1DPC in all other channels, you run at 800MHz
- 95 Watt CPU's are required for 1333MHz DIMM speeds. All other CPU's are capable of up to 1066MHz
- References to the above MHz speeds are for the various speeds of DDR3 DIMMs; 1333 refers to DDR3-1333, etc.

DIMM slot and configuration diagrams

Basic memory slot & population diagram

- Population order; start with "A" first, "B" second, "C" third, etc.

18 DIMM SLOTS (9 per CPU node)					
	CPU1		CPU2		
	slot #	population order	slot #	population order	
Chnl 1	1	G	1	G	Chnl 1
	2	D	2	D	
	3	A	3	A	
Chnl 2	4	H	4	H	Chnl 2
	5	E	5	E	
	6	B	6	B	
Chnl 3	7	I	7	I	Chnl 3
	8	F	8	F	
	9	C	9	C	

Standard memory configuration (1 CPU model)

- 6GB, consisting of three (3) 2GB dual-rank PC3-10600 RDIMMs

Memory

	CPU1		CPU2		
	slot #	population order	slot #	population order	
Chnl 1	1	G; empty	1	G; empty	Chnl 1
	2	D; empty	2	D; empty	
	3	A; 2GB DIMM	3	A; empty	
Chnl 2	4	H; empty	4	H; empty	Chnl 2
	5	E; empty	5	E; empty	
	6	B; 2GB DIMM	6	B; empty	
Chnl 3	7	I; empty	7	I; empty	Chnl 3
	8	F; empty	8	F; empty	
	9	C; 2GB DIMM	9	C; empty	

Standard memory plus optional memory (1 CPU model)

- 54GB, consisting of three (3) 2GB RDIMMs plus six (6) 8GB RDIMMs
- 3x 2GB dual-rank PC3-10600 RDIMMs
- 6x 8GB dual-rank PC3-10600 or PC3-8500 RDIMMs

	CPU1		CPU2		
	slot #	population order	slot #	population order	
Chnl 1	1	G; 8GB DIMM	1	G; empty	Chnl 1
	2	D; 8GB DIMM	2	D; empty	
	3	A; 2GB DIMM	3	A; empty	
Chnl 2	4	H; 8GB DIMM	4	H; empty	Chnl 2
	5	E; 8GB DIMM	5	E; empty	
	6	B; 2GB DIMM	6	B; empty	
Chnl 3	7	I; 8GB DIMM	7	I; empty	Chnl 3
	8	F; 8GB DIMM	8	F; empty	
	9	C; 2GB DIMM	9	C; empty	

Standard memory replaced with optional memory (1 CPU model)
RDIMM maximum configuration

- 72GB, consisting of nine (9) 8GB dual-rank PC3-10600 or PC3-8500 RDIMMs

Memory

	CPU1		CPU2		
	slot #	population order	slot #	population order	
Chnl 1	1	G; 8GB DIMM	1	G; empty	Chnl 1
	2	D; 8GB DIMM	2	D; empty	
	3	A; 8GB DIMM	3	A; empty	
Chnl 2	4	H; 8GB DIMM	4	H; empty	Chnl 2
	5	E; 8GB DIMM	5	E; empty	
	6	B; 8GB DIMM	6	B; empty	
Chnl 3	7	I; 8GB DIMM	7	I; empty	Chnl 3
	8	F; 8GB DIMM	8	F; empty	
	9	C; 8GB DIMM	9	C; empty	

UDIMM maximum configuration (1 CPU model)

- 12GB, consisting of six (6) 2GB dual-rank PC3-10600 UDIMMs

	CPU1		CPU2		
	slot #	population order	slot #	population order	
Chnl 1	1	G; empty	1	G; empty	Chnl 1
	2	D; 2GB DIMM	2	D; empty	
	3	A; 2GB DIMM	3	A; empty	
Chnl 2	4	H; empty	4	H; empty	Chnl 2
	5	E; 2GB DIMM	5	E; empty	
	6	B; 2GB DIMM	6	B; empty	
Chnl 3	7	I; empty	7	I; empty	Chnl 3
	8	F; 2GB DIMM	8	F; empty	
	9	C; 2GB DIMM	9	C; empty	

Standard memory replaced with optional memory (2 CPU model)
RDIMM maximum configuration

- 144GB, consisting of eighteen (18) 8GB PC3-10600 or PC3-8500 RDIMMs

Memory

	CPU1		CPU2		
	slot #	population order	slot #	population order	
Chnl 1	1	G; 8GB DIMM	1	G; 8GB DIMM	Chnl 1
	2	D; 8GB DIMM	2	D; 8GB DIMM	
	3	A; 8GB DIMM	3	A; 8GB DIMM	
Chnl 2	4	H; 8GB DIMM	4	H; 8GB DIMM	Chnl 2
	5	E; 8GB DIMM	5	E; 8GB DIMM	
	6	B; 8GB DIMM	6	B; 8GB DIMM	
Chnl 3	7	I; 8GB DIMM	7	I; 8GB DIMM	Chnl 3
	8	F; 8GB DIMM	8	F; 8GB DIMM	
	9	C; 8GB DIMM	9	C; 8GB DIMM	

UDIMM maximum configuration (2 CPU model)

- 24GB, consisting of twelve (12) 2GB dual-rank PC3-10600 UDIMMs

	CPU1		CPU2		
	slot #	population order	slot #	population order	
Chnl 1	1	G; empty	1	G; empty	Chnl 1
	2	D; 2GB DIMM	2	D; 2GB DIMM	
	3	A; 2GB DIMM	3	A; 2GB DIMM	
Chnl 2	4	H; empty	4	H; empty	Chnl 2
	5	E; 2GB DIMM	5	E; 2GB DIMM	
	6	B; 2GB DIMM	6	B; 2GB DIMM	
Chnl 3	7	I; empty	7	I; empty	Chnl 3
	8	F; 2GB DIMM	8	F; 2GB DIMM	
	9	C; 2GB DIMM	9	C; 2GB DIMM	

NOTE: Capacity references are rounded to the common Gigabyte values.

- 1GB = 1024MB
- 2GB = 2048MB
- 4GB = 4096MB
- 8GB = 8192MB

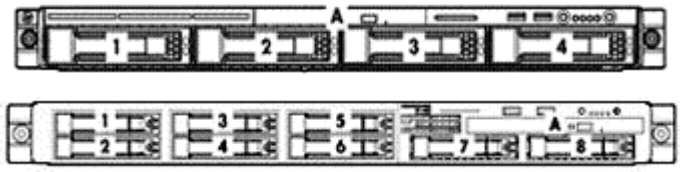
Memory

Following are memory options available from HP:

Memory	Registered DIMMs (RDIMMs)	
	HP 2GB 2Rx8 PC3-10600R-9 Kit	500656-B21
	HP 4GB 2Rx4 PC3-10600R-9 Kit	500658-B21
	HP 4GB 4Rx8 PC3-8500R-7 LP Kit	500660-B21
	HP 8GB 2Rx4 PC3-10600R-9 Kit	500662-B21
	HP 8GB 2Rx4 PC3-8500R-7 Kit	516423-B21
	Unbuffered with ECC DIMMs (UDIMMs)	
	HP 1GB 1Rx8 PC3-10600E-9 Kit	500668-B21
	HP 2GB 2Rx8 PC3-10600E-9 Kit	500670-B21

NOTE: All DDR3 memory option kits consist of one DIMM per kit. For detailed memory configuration rules and guidelines, please use the Online DDR3 Memory Configuration Tool: www.hp.com/go/ddr3memory-configurator.

NOTE: Kits described as LP include Low Power DIMMs. For more information on ProLiant Energy Efficient Features, see: www.hp.com/go/proliant-evnergy-efficient



1-4 Four Non-hot plug SATA or four 3.5" Hot-plug SAS/SATA hard drive bays
A Optional DVD-ROM, or DVD RW
1-8 Eight Hot-plug SATA/SAS hard drive bays
A Optional DVD-ROM, or DVD RW

Drive Support

	Quantity Supported	Position Supported	Controller
Removable Media			
DVD-ROM	Up to 1	A	Integrated IDE (ATAPI) (optional)
DVD RW	Up to 1	A	Integrated IDE (ATAPI) (optional)

Hard Drives

NOTE: The components of a storage subsystem (e.g. the drive, the HBA/controller, and the server backplane) should operate at the same data transfer rate or the system bandwidth will be negotiated down to an acceptable level for all components.

SATA Hot Plug SFF Midline (MDL) Drives

	Quantity Supported	Position Supported	Controller
500GB 3GSATA 7.2K 160GB 3G SATA 7.2K	Up to 4	1-4	HP Embedded SATA RAID Controller NOTE: Transfer rate: 1.5 Gb/s SATA

SATA Hot Plug SFF Entry (ETY) Drives

	Quantity Supported	Position Supported	Controller
250GB 3G SATA 5.4K 120GB 1.5G SATA 5.4K	Up to 4	1-4	HP Embedded SATA RAID Controller NOTE: Transfer rate: 1.5 Gb/s SATA

SATA Non-Hot Plug 3.5" Midline (MDL) Drives

	Quantity Supported	Position Supported	Controller
250GB 3G SATA 7.2K 500GB 3GSATA 7.2K 750GB 3G SATA 7.2K	Up to 4	1-4	HP Embedded SATA RAID Controller NOTE: Transfer rate: 1.5 Gb/s SATA

SATA Non-Hot Plug 3.5" Entry (ETY) Drives

	Quantity Supported	Position Supported	Controller
160GB 3G SATA 7.2K	Up to 4	1-4	HP Embedded SATA RAID Controller NOTE: Transfer rate: 1.5 Gb/s SATA

SATA Hot Plug Midline (MDL) Drives

	Quantity Supported	Position Supported	Controller

Storage

160GB 3G SATA 7.2K 250GB 3G SATA 7.2K 500GB 3G SATA 7.2K 750GB 3G SATA 7.2K 1TB 3G SATA 7.2K	Up to 4	1-4	HP Smart Array P212 Controller HP Smart Arrays P410 Controller NOTE: Transfer rates up to 1.5 Gb/s

SATA Hot Plug 3.5" Entry (ETY) Drives

	Quantity Supported	Position Supported	Controller
160GB 3G SATA 7.2K	Up to 4	1-4	HP Smart Array P212 Controller HP Smart Arrays P410 Controller NOTE: Transfer rates up to 1.5 Gb/s

SAS Hot Plug Midline (MDL) Drives

	Quantity Supported	Position Supported	Controller
500 6G 7.2K	Up to 4	1-4	HP Smart Array P212 Controller HP Smart Arrays P410 Controller NOTE: Support for transfer rates up to 3 Gb/s

SAS Hot Plug 3.5" Midline (MDL) Drives

	Quantity Supported	Position Supported	Controller
1TB 3G 7.2K 750 3G 7.2K	Up to 4	1-4	HP Smart Array P212 Controller HP Smart Arrays P410 Controller NOTE: Support for transfer rates up to 3 Gb/s

SAS Hot Plug SFF Enterprise (ENT) Drives

	Quantity Supported	Position Supported	Controller
300GB 6G 10K 300GB 3G 10K 146GB 6G 15K 146GB 3G 15K 146GB 6G 10K 146GB 3G 10K 72GB 6G 15K 72GB 3G 10K	Up to 4	1-4	HP Smart Array P212 Controller HP Smart Array P410 Controller NOTE: Support for transfer rates up to 3 Gb/s

SAS Hot Plug 3.5" Enterprise (ENT) Drives

	Quantity Supported	Position Supported	Controller
450GB 3G 15K 400GB 3G 10K 300GB 3G 15K 146GB 3G 15K 72GB 3G 15K	Up to 4	1-4	HP Smart Array P212 Controller HP Smart Array P410 Controller NOTE: Support for transfer rates up to 3 Gb/s

Storage

External Storage

	Quantity Supported	Position Supported	Host Controller or Adapter
20 Modular Smart Array	Up to 2 per SA-6402 Up to 4 per SA-6404	External	HP Smart Array P212/256MB Controller HP Smart Array P212/256MB Controller HP Smart Array P411/256MB Controller
50 Modular Smart Array	Up to 2	External	
60 HP StorageWorks Modular Smart Array	Up to 8	External	
70 HP StorageWorks Modular Smart Array	Up to 8	External	

Tape and Disk-Based Backup

NOTE: For a complete listing of compatible tape and disk-based backup offerings, please visit: http://www.hp.com/go/connect.

	Position Supported	Controller	Controller/HBA Option Kit Part Number
HP StorageWorks SCSI Tape Drives, External LTO-1 Ultrium 232 LTO-2 Ultrium 448 LTO-3 Ultrium 920 LTO-3 Ultrium 960 LTO4 Ultrium 1760 LTO-4 Ultrium 1840 DAT 40 DAT 72 DAT 160 1U Rack-Mount Kit 3U Rack-Mount Kit	External	HP SC11Xe Host Bus Adapter	412911-B21
HP StorageWorks USB Tape Drives, External DAT 40 USB DAT 72 USB DAT 160 USB 1U USB Rack-Mount Kit	External	USB 2.0 Port	N/A
HP StorageWorks SAS Tape Drives, External DAT 160 SAS LTO-2 Ultrium 448 SAS LTO-3 Ultrium 920 SAS LTO-4 Ultrium 1760 SAS LTO-4 Ultrium 1840 SAS 1U Rack-Mount Kit	External	HP Smart Array P212/Zero Memory (ZM) Controller	462828-B21

Storage

3U Rack-Mount Kit

HP StorageWorks SCSI Tape Automation, External DAT 72x10 Autoloader 1/8 G2 Autoloader MSL2024 MSL4048	External	HP SC11Xe Host Bus Adapter HP U320e SCSI Host Bus Adapter NOTE: Recommended for MSL tape libraries.	412911-B21 AH627A
HP StorageWorks SAS Tape Automation, External 1/8 G2 Autoloader MSL2024 MSL4048	External	HP Smart Array P212/Zero Memory (ZM) Controller	462828-B21
HP StorageWorks Fibre Tape Automation, External MSL2024 MSL4048 MSL8096 MSL6000	External	Please consult the EBS connectivity matrix at: http://www.hp.com/go/ebs for detailed connectivity information.	N/A
HP StorageWorks RDX Removable Disk Backup System, External RDX160 RDX320 RDX500	External	USB 2.0 port	N/A
HP StorageWorks D2D Backup Systems D2D120 D2D130 D2D2500i D2D4000i	External	Embedded Network Controller	N/A

Power Specifications

HP 500W Power Supply Part Number - AC 500W PSU	515915-B21 Option Kit					
Input Voltage Range (Vrms)	100 to 240					
Frequency Range (Nominal) (Hz)	47/63					
Nominal Input Voltage (Vrms)	100	120	200	220	230	240
Maximum Rated Output Wattage	500	500	500	500	500	500
Nominal Input Current (A rms)	5.74	4.99	2.86	2.58	2.46	2.36
Max Rated Input Wattage Rating (Watts)	568	568	562	556	556	556
Max. Rated VA (Volt-Amp)	574	574	573	567	567	567
Efficiency (%) at Max. Rated Output Wattage	88	88	89	90	90	90
Power Factor	0.99	0.99	0.98	0.98	0.98	0.98
Leakage Current (mA)	0.42	0.50	0.81	0.91	0.95	1.00
Max. Inrush Current (A peak)	30	30	30	30	30	30
Max. Inrush Current duration (mS)	20	20	20	20	20	20
Maximum British Thermal Unit Rating (BTU-Hr)						

HP 460W Power Supply Part Number - AC 460W PSU	503296-B21 Option Kit						
Input Voltage Range (Vrms)	100 to 240						
Frequency Range (Nominal) (Hz)	50/60						
Nominal Input Voltage (Vrms)	100	120	200	208	220	230	240
Maximum Rated Output Wattage	460	460	460	460	460	460	460
Nominal Input Current (A rms)	5.5	4.5	2.6	2.5	2.4	2.3	2.2
Max Rated Input Wattage Rating (Watts)	526	520	505	505	503	503	503
Max. Rated VA (Volt-Amp)	548	542	527	527	524	524	524
Efficiency (%) at Max. Rated Output Wattage	87.5	88.5	91	91	91.5	91.5	91.5
Power Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Leakage Current (mA)	0.42	0.50	0.83	0.87	0.92	0.96	1.00
Max. Inrush Current (A peak)	30	30	30	30	30	30	30
Max. Inrush Current duration (mS)	20	20	20	20	20	20	20
Maximum British Thermal Unit Rating (BTU-Hr)	1794	1773	1725	1725	1715	1715	1715

Power Specifications

HP 750W Power Supply Part Number - AC 750W PSU	512327-B21 Option Kit						
Input Voltage Range (Vrms)	100 to 240						
Frequency Range (Nominal) (Hz)	50/60						
Nominal Input Voltage (Vrms)	100	120	200	208	220	230	240
Max Rated Output Wattage Rating	750	750	750	750	750	750	750
Nominal Input Current (A rms)	8.9	7.4	4.3	4.1	3.9	3.7	3.6
Max Rated Input Wattage Rating (Watts)	857	847	824	825	820	820	820
Max. Rated VA (Volt-Amp)	894	884	859	859	854	854	854
Efficiency (%) at Max. Rated Output Wattage	87.5	88.5	91	91	91.5	91.5	91.5
Power Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Leakage Current (mA)	0.42	0.50	0.83	0.87	0.92	0.96	1.00
Max. Inrush Current (A peak)	30	30	30	30	30	30	30
Max. Inrush Current duration (mS)	20	20	20	20	20	20	20
Maximum British Thermal Unit Rating (BTU-Hr)	2925	2892	2812	2812	2797	2797	2797

NOTE:
To review typical system power ratings use the Active Answers Power Advisor which is available via the online tool located at URL: www.hp.com/go/proliant-energy-efficient or www.hp.com/go/hppoweradvisor

Power		
ProLiant DL160 G6 Fully Configured	115V/60Hz	220V/50Hz
Fully Loaded System Input Wattage (W)	448	445
Fully Loaded System Input Current (A rms)	3.833	2.046
Fully Loaded System Thermal (BTU- Hr)	1529	1518
Fully Loaded System VA (Volt-Amp)	449	454
System Inrush Current with all power supplies loaded (A)	10.1	10.96
Power cord requirements	Nema 5-15P to IEC320-C13	IEC320-C13 to IEC320-C14
NOTE: Power shown is for a fully configured system consisting of (2) CPU, (8) double-sided DIMMs, (2) HDDs, (1) CD-ROM, and (2) PCI cards.		
Power Cord	AF556A	

Server Power Cords

One 6' Highline (IEC-IEC) power cord ships standard

NOTE: HP ProLiant DL servers no longer ship standard with NEMA power cords (163719-002) that allow connection to 110V US wall outlets in a home or office. ProLiant DL servers are primarily connected to PDU's in data center racks so they now ship standard with only a PDU power cord (416151-B21). If a user wishes to power a ProLiant DL server using a 110V receptacle (NEMA-15), the NEMA power cord (227099-001) must be ordered separately.

If customers require a local power cord, they can check the power cord matrix for the appropriate cord. Please see the following power cord matrix: http://www.hp.com/go/powercordmatrix.

System Unit	Dimensions (H x W x D) (with bezel)	1.70 x 17.64 x 26.85 in (4.32 x 44.80 x 68.20 cm)		
	Weight (approximate)	Maximum (all hard drives, power supplies, and processors installed)	34.00 lb (16.78 kg)	
		Minimum (one hard drive, power supply, and processor installed)	28.00 lb (12.7 kg)	
	Input Requirements (per power supply)	Rated Line Voltage	90 to 132 VAC 180 to 264 VAC	
		Rated Input Current	5. 8 Amps (at 100 VAC) to 2.9 Amps (at 200 VAC)	
		Rated Input Frequency	47 to 63 Hz	
	BTU Rating	Rated Input Power	570W (at 100 VAC) 565W (at 200 VAC)	
		Maximum	500W	1940 BTU / hr (at 100 VAC) 1920 BTU/hr (at 200 VAC)
			460W	1773 BTU / hr (at 120 VAC) 1715 (at 240 VAC)
			750W	2892 BTU / hr (at 120 VAC) 2797 (at 240 VAC)
	Power Specifications	To review typical system power ratings use the Power Advisor which is available via the online tool located at URL: www.hp.com/go/proliant-energy-efficient Or www.hp.com/go/hppoweradvisor - Click on the system of interest. Example: DL160 G6 - Follow the instructions of the next screens.		
	Power Supply Output (per power supply)	Rated Steady-State Power	500 Watts (at 100 VAC), 500 Watts (at 200 VAC)	
		Maximum Peak Power (See Power Specifications Tables)	500Watts (at 100 VAC), 500 Watts (at 200 VAC)	
	System Inlet Temperature	Operating	10° to 35°C (50° to 95°F) at sea level with an altitude derating of 1.0°C per every 305 m (1.8°F per every 1000 ft) above sea level to a maximum of 3050 m (10,000 ft), no direct sustained sunlight. Maximum rate of change is 10°C/hr (18°F/hr). The upper limit may be limited by the type and number of options	

		installed. System performance may be reduced if operating with a fan fault or above 30°C (86°F).
	Non-operating	-30° to 60°C (-22° to 140°F). Maximum rate of change is 20°C/hr (36°F/hr).
Relative Humidity (non-condensing)	Operating	10 to 90% relative humidity (Rh), 28°C (82.4°F) maximum wet bulb temperature, non-condensing.
	Non-operating	-30° to 60°C (-22° to 140°F). Maximum rate of change is 20°C/hr (36°F/hr).
Altitude	Operating	3050 m (10,000 ft). This value may be limited by the type and number of options installed. Maximum allowable altitude change rate is 457 m/min (1500 ft/min).
	Non-operating	9144 m (30,000 ft). Maximum allowable altitude change rate is 457 m/min (1500 ft/min).
Acoustic Noise	Listed are the declared A-Weighted sound power levels (LWAd) and declared average bystander position A-Weighted sound pressure levels (LpAm) when the product is operating in a 23°C ambient environment. Noise emissions were measured in accordance with ISO 7779 (ECMA 74) and declared in accordance with ISO 9296 (ECMA 109).	
	Idle	
	LWAd	6.3B
	LpAm	48dBA
	Operating	
	LWAd	6.3B
	LpAm	48dBA
Emissions Classification (EMC)	FCC Rating	Class A
	Normative Standards	CISPR 22; EN55022; EN55024; FCC CFR 47, Pt 15; ICES-003; CNS13438; GB9254; K22;K24; EN 61000-3-2; EN 61000-3-3; EN 60950-1; IEC 60950-1

NOTE: Product conformance to cited product specifications is based on sample (type) testing, evaluation, or assessment. This product or family of products is eligible to bear the appropriate compliance logos and statements.

Technical Specifications

Non-Hot Plug SATA Hard Drives	160-GB 7.2K 458947-B21		
	Capacity	160,041 MB	
	Height	1.028 in (2.61 cm)	
	Width	4.0 in (10.16 cm)	
	Depth	5.787 in (147.0 mm)	
	Interface	SATA ATA	
	Transfer Rate Synchronous (Maximum)	1.5Gb/s	
	Seek Time (typical reads, including settling)	Single Track	0.9 ms
		Average	9.0 ms
		Full-Stroke	17.8 ms
		Rotational Speed	7,200 rpm
	Physical Configuration	Bytes/Sector	512
		Logical Blocks	312,581,808
	Operating Temperature	41° to 131° F (5° to 55° C)	

NC362i Integrated Dual Port Gigabit Server Adapter	**Network Interface**	Integrated 10/100/1000BASE-T Transceiver Combines a triple-speed IEEE 802.3TM - Compliant Media Access Controller (MAC) with a triple-speed Ethernet transceiver.	
	Data Transfer Method	Compliant to x1 PCIe Specification	
	Network Transfer Rate	10Base-T (Half-Duplex)	10 Mb/s
		10Base-T (Full-Duplex)	20 Mb/s
		100Base-TX (Half-Duplex)	100 Mb/s
		100Base-TX (Full-Duplex)	200 Mb/s
		1000Base-TX (Half and Full-Duplex)	2000Mb/s
	Connector	RJ-45 connector	
	Cable Support	Performs all the physical layer functions for 10BASE-T, 100BASE-T, and 1000BASE-T Ethemet on standard Category 5 UTP	

Technical Specifications

Smart Array P410/410i Controller	Disk Drive and Enclosure Interface	3G SAS (Serial Attached SCSI) 1.5G SATA (Serial ATA)
	SAS Connectors	2 internal (Mini-SAS) x8 wide port connectors
	Cache Memory Speed	DDR2-533MHz with 40 or 72-bit wide bus provides up to 4.2 GB/s maximum bandwidth.
	Server Interface	x8 2.5G PCIe 2.0 provides 2GB/s maximum bandwidth
	SAS Speed	x8 3G SAS provides 2.4GB/s maximum bandwidth
	Cache Memory	40-bit 256MB ECC protected cache (72-bit 512MB BBWC module upgrades available); transportable with battery-backed upgrade
	Logical Drives Supported	Up to 32 logical drives
	Host Memory Addressing	64-bit, supporting greater than 4GB server memory space
	RAID Support	RAID 6, 6+0 (Advanced Data Guarding) NOTE: The minimum of 256 MB cache, battery kit, and Smart Array Advanced Pack License Key upgrade is required to enable RAID 6, 6+0 RAID 5, 5+0 (Distributed Data Guarding) NOTE: The 256 MB & Battery Kit upgrade is required to enable RAID 5, 5+0 support of the Smart Array P410i RAID 1+0 (Striping & Mirroring) RAID 0 (Striping)

Environment-friendly Products and Approach	End-of-life Management and Recycling	Hewlett-Packard offers end-of-life HP product return, trade-in, and recycling programs in many geographic areas. For trade-in information, please go to: http://www.hp.com/go/green. To recycle your product, please go to: http://www.hp.com/go/green or contact your nearest HP sales office. Products returned to HP will be recycled, recovered or disposed of in a responsible manner. The EU WEEE directive (2002/95/EC) requires manufacturers to provide treatment information for each product type for use by treatment facilities. This information (product disassembly instructions) is posted on the Hewlett Packard web site at: http://www.hp.com/go/green. These instructions may be used by recyclers and other WEEE treatment facilities as well as HP OEM customers who integrate and re-sell HP equipment.

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For hard drives, 1GB = 1 billion bytes. Actual formatted capacity is less.